

REMARKS

Applicants thank the Examiner for the careful examination of this application and the clear explanation of the rejections.

Claim 1 claims a method for forming shallow trench isolation structures. The method forms a plurality of isolation trenches in a substrate. The isolation trenches separate active areas. The method then forms an insulation layer outwardly from the substrate. The insulation layer fills the isolation trenches and covers the active areas. The method then forms a PLANARIZATION layer outwardly from the insulation layer, and removes the planarization layer and the insulation layer down to a polished stop for the active areas.

Claim 1 includes a limitation of forming a planarization layer outwardly from the insulation layer. As described in the section Detailed Description of the Invention, page 9, line 28, 'a planarization layer 46 is formed outwardly of the insulation layer 44. Planarization layer 46 provides a substantially planar surface for final formation of isolation trench structure.'

In contrast, the Lin patent teaches a process that teaches away from forming a planarization layer outwardly from the insulation layer. It is illustrated in Fig. 1, 2, 3, and 4 and described in column 7, line 13 of the specification which states that 'it is a major advantage of the invention that the invention's HDPCVD layer has high areas 40A that are in roughly proportion to the width of the wide raised portions 12A because the high areas 40A are

used to make a self aligned SiN etch mask 44.' In other words, the process of the Lin patent depends on the non-planar character of the LDPCVD and the conforming etch barrier layer 44. Therefore, the Lin patent does not anticipate claim 1 of Applicants' invention.

Claims 2-12 are dependent claims based on claim 1 and further include additional limitation not taught in the reference. Since claim 1 stands patentable over the Lin patent, claim 2-12 stand patentable. Particularly, claim 2 claims the method in which the removing the planarization layer and the insulation layer further comprises etching through the planarization layer and the insulation layer together at a substantially even rate down to a chemical mechanical polishing (CMP) depth outward from the active areas. Claim 4 claims the method in which the matched etch comprises a resist etch back plasma etch.

Claim 13 claims a method for forming an integrated circuit. The method forms a plurality of isolation trenches in a substrate. The isolation trenches separate active areas. The method then forms an insulation layer outwardly from the substrate. The insulation layer fills the isolation trenches and covers the active areas. The method then forms a planarization layer outwardly from the insulation layer. The method then etches through the planarization layer and the insulation layer together at a substantially even rate down to a chemical mechanical polishing (CMP) depth outward from the active areas. The method then chemically-mechanically polishes from the CMP depth down to a polish stop for the active areas and the method forms integrated circuit devices in the active areas to form an integrated circuit on the substrate.

As with claim 1, claim 13 also includes the limitation of forming a planarization layer outwardly from the insulation layer. As explained above, as described in the section Detailed Description of the Invention, page 9, line 28, 'a planarization layer 46 is formed outwardly of the insulation layer 44. Planarization layer 46 provides a substantially planar surface for final formation of isolation trench structure.'

Claim 13 is patentable over the Lin patent for the same reason that claim 1 is patentable over the Lin patent. Claim 13 has a limitation of forming a PLANARIZATION layer outwardly from the insulation layer. As described in the specification, 'planarization layer 46 provides a substantially planar surface for final formation of isolation trench structure.' In contrast, the Lin patent depends on the non-planar character of the LDPCVD and the conforming etch barrier layer 44. Therefore, the Lin patent does not anticipate claim 13 of Applicants' invention.

Dependent claims 14-20 are based on the independent claim 13 and include further limitation not taught in the cited reference. Since claim 13 stands patentable over the cited reference, claims 14-20 stand patentable.

While the Examiner did not disposition claim 21, it stands patentable over the cited reference for the same reason as claims 1 and 13 do. Claim 21 claims a method for forming shallow trench isolation structures. The method forms a plurality of isolation trenches in a substrate. The isolation trenches separate active areas of the substrate. The method then forms an insulation layer outwardly from the substrate. The insulation layer fills

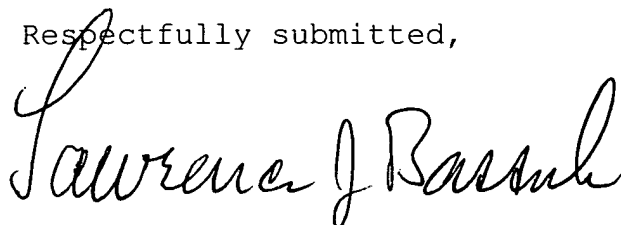
the isolation trenches and covers the active areas. The method then etches through the planarization layer and the insulation layer together at a substantially even rate down to an intermediate level with 1500 angstroms of a polish stop for the active areas using a matched etch process that etches the planarization layer and the insulation layer at rates that differ by ten percent or less. The method then chemically-mechanically polishes from the intermediate level down to the polish stop for the active areas of the substrate.

As with claims 1 and 13, claim 21 also includes a limitation of forming a PLANARIZATION layer outwardly from the insulation layer. As described in the specification, 'planarization layer 46 provides a substantially planar surface for final formation of isolation trench structure.' In contrast, the Lin patent depends on the non-planar character of the LDPCVD and the conforming etch barrier layer 44. Therefore, the Lin patent does not anticipate claim 21 of Applicants' invention.

Applicants respectfully assert that the application is in allowable form and the claims distinguish over the cited references. The depending claims also are allowable as depending from allowable independent claims 1, 13, and 21 and as including further limitations not taught or suggested in the cited art.

Applicants respectfully request the reconsideration or further examination of this application.

Respectfully submitted,

A handwritten signature in cursive script, reading "Lawrence J. Bassuk". The signature is written in dark ink and is positioned above the typed name and title.

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